

Gaze behavior in dance – the relevance of spotting in multiple rotations

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Objectives: The present study seeks to investigate more closely the role of spotting in ballet dancers. It could be hypothesized that spotting is functional in preventing dizziness, or that it is unrelated to dizziness but rather facilitates precise realignment of the body in the spatial reference framework and therefore guarantees postural stability. In the former case the role of the vestibular system would be crucial; in the latter case the visual reference frame would be most important. The present study aims to uncover whether spotting helps postural stability after repeated body rotation and whether dizziness is less distinct after rotations with than without spotting.

Methods and Analysis: Therefore, we tested a sample of 24 novice dancers (and we will test a sample of 8-12 professional ballet dancers) for postural stability while turning consecutively around their longitudinal axis. For the passive turning condition, participants were rotated 14 times on a rotating chair. In the active turning condition, participants performed 14 consecutive turns at a constant speed (as instructed by the beats of a metronome). Both conditions were performed once with and once without spotting. Before and after the rotations, Centre-of-Pressure (COP) displacement in quiet stance was measured on a force plate to examine postural stability. Moreover, to examine the dancers' dizziness, participants indicated their perception of vertigo after-effect measured by self-assessment using a 0 – 20 scale.

Conclusion: Results from the novice dancers showed that balance after turning with the spotting technique was better than turning without spotting in both active and passive turning conditions ($p=.047$). It thus seems that spotting helps balance control after rotations. Across passive and active conditions, spotting reduced perceived dizziness ($p=.014$). Across spotting and non-spotting conditions, active turning reduced dizziness ($p=.023$). But more importantly, the two-way interaction was significant ($p<.001$): The effect of spotting on perceived dizziness flipped direction between passive and active turning conditions. When novice dancers were passively turned, they felt less dizzy when spotting. In contrast, when they actively turned, they felt dizzier when spotting. In conclusion, an inefficient spotting-technique might rather provoke dizziness instead of avoiding it in the novice dancers. We expect a different outcome for the professional dancers and will report these results during our presentation.